

# COSTS OF FOODS PURCHASED BY USDA AND LOCAL SCHOOL SYSTEMS, 1973/74



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## ABSTRACT

Prices paid for 15 foods by USDA and different-size school systems were compared for 1973/74. School systems were grouped into five size categories ranging from fewer than 2,500 students to 25,000 or more. Data were obtained from telephone interviews with school personnel.

The average price paid per pound of all foods was substantially lower for school systems with 25,000 or more students than for those with fewer than 2,500 students. Products with greatest cost differences were turkey, chicken, ground beef, and frankfurters. Price paid per pound averaged over 7 percent higher for all schools than for USDA.

*Keywords:* School systems, food costs, USDA commodity program, prices, Federal administrative costs, intrastate costs.

## PREFACE

When the Food and Nutrition Service requested that the Economic Research Service conduct a study of comparative costs of foods purchased by USDA and local school systems, a task force composed of staff members from both agencies was established to prepare the necessary schedules and collect the information. Members of the task force were:

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## SUMMARY

The average price per pound paid in 1973/74 by school systems of 25,000 or more students for a uniform selection of 15 foods was substantially lower than the price paid by school systems with 2,500 or fewer students. Products with greatest cost differences were turkey, chicken, ground beef, and frankfurters, with differences in price per pound ranging from 5 cents to 19.2 cents.

Prices reported by the school systems with 25,000 students or more were essentially the same as those paid by USDA, averaging 0.3 percent higher. However, the smallest school systems paid prices averaging 18.4 percent higher than those paid by USDA. For school systems of all sizes, prices averaged 7.2 percent higher than for USDA.

USDA and the largest school systems benefited from substantial economies of scale in procurement, particularly in comparisons with the smallest schools. Given the magnitude of the total food purchased annually for school use (about \$1.8 billion), the Nation's schools can potentially save several hundred million dollars by means of more effective procurement practices.

# COSTS OF FOODS PURCHASED BY USDA AND LOCAL SCHOOL SYSTEMS, 1973/74

## INTRODUCTION

This study was undertaken to determine the cost of a uniform bundle of foods purchased in the open market during the 1973/74 school year at prices paid by: (1) the U.S. Department of Agriculture (USDA) commodity program; (2) the largest school systems; (3) the smallest systems; and (4) all school systems combined.

The school systems purchased a much wider range of

foods than did USDA. Because of the need for comparability among foods selected, not all of the foods purchased by the school systems were included. Fifteen foods were selected which had been purchased both by the school systems and USDA between July 1973 and April 1974. The total cost of these foods either had been or was expected to be substantial.

## THE STUDY

Time constraints limited the scope of the survey and the size of the sample.<sup>1</sup> Within the 50 States and the District of Columbia, the Office of Education listed 16,503 public school systems for 1972/73. A system could be a single school, although most of those selected contained multiple units. The school systems were stratified according to five enrollment sizes:

### Number of students

25,000 or more
10,000 - 24,999
5,000 - 9,999
2,500 - 4,999
Fewer than 2,500

A random sample of 30 public school systems containing elementary and secondary schools was drawn within each size category, providing a total of 150. Within each strata, each school system within the 50 States and the District of Columbia had an equal opportunity to be selected.

An alternate sample was also drawn so that each sampling unit would have a replacement if a sampling unit of the original draw either would not cooperate or did not contain any public elementary or secondary school participating in the National School Lunch Program of 1973/74.

Although the sample of 150 school systems is a small share of the total 16,305 systems, their purchases

represent a 150-market sample of all markets from which school systems bought their foods.<sup>2</sup> Thus, market prices paid for specified commodities were sampled during the current school year from 150 markets. Most purchases were made at other than retail markets and in markets serving a number of school systems. The 150 school systems thus represent more completely prices paid by school systems than might be immediately obvious.

Time constraints precluded data collection by personal interview or mailed questionnaire. Data were obtained by telephone. Two calls were placed to each of the schools. The initial call explained the reasons for the study and discussed the information needed. The second call was placed 2 or 3 days later. At that time, a representative of the school system reported the desired information. The outline used to discuss the needed information items, the formats used to record them, and the edited data used for analysis are shown in the appendix (exhibit 1, p. 10).

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<sup>2</sup> In a few instances, the State purchasing agency bought all items which were distributed to the schools in the entire State. Thus, by drawing one school system, the sample contained the information for all school systems within the State.

There really are two universes of markets—the universe of all markets from which schools potentially could buy, and the universe of markets from which they actually bought foods. By sampling the school systems, the universe of markets from which school systems made purchases during 1973/74 likewise was sampled. The 150-school-system sample was considered acceptable in part because a similar sample size in an earlier study of school lunch total costs provided acceptable data.

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<sup>1</sup> The Office of Management and Budget clearance was received on April 19, 1974. The preliminary report was delivered on May 1.



## COSTS TO LOCAL SCHOOL SYSTEMS

### Prices Paid by Size of School System

For each of the 15 food items, the average price per pound paid by the largest schools (25,000 or more students) was less than the price paid by the smallest schools (fewer than 2,500 students) (table 1). There were substantial differences for: turkey, 14.2 cents; chicken, 19.2 cents; ground beef, 5 cents; and frankfurters, 11.7 cents. The percentage differences between prices paid by the largest and smallest school systems were: chicken, 35.4 percent; ground beef, 5.1 percent; and frankfurters, 14.5 percent. Because these foods are relatively high in cost and are excellent sources of protein, such differences are especially noteworthy.

Size of school system and price per pound paid for each food were not as highly related among the other three size categories of systems. For example, for seven foods, prices were lowest in the second largest system (10,000-24,999 students); for two foods, prices in the second largest system were the same as or lower than in the smaller systems; and for six foods, prices were lowest in at least one of the smaller systems. However, of the seven foods which cost the least in school systems with

10,000-24,999 students, four were basic sources of protein.

School systems with fewer than 5,000 students generally paid more than those in the two largest size categories. The foods which provide excellent sources of protein showed the greatest absolute price differences.

### Prices by Source of Purchases

School systems purchased foods through one or more of the following types of sellers: (1) processors (canners, freezers, packers); (2) wholesalers; (3) county or State purchasing agencies (which buy all items for the schools); and (4) retail merchants.

Table 2 reports the simple average price paid for each pound of food purchased from each of the four sources of purchase. Processors and county/State agencies would be expected to be the lowest-cost sources for most items. For the nine foods which were purchased from each of the four sellers, the processor had the lowest price for two foods; the wholesaler, for one food; the county/State purchasing agency, for five foods; and the retailer, for one food. The county/State agencies were

Table 1 Average prices paid by USDA and school systems for foods purchased, July 1973-April 1974

Food	USDA <sup>1</sup>	School systems by number of students <sup>2</sup>				
		Less than 2,500	2,500-4,999	5,000-9,999	10,000- 24,999	25,000- and above
	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>
Turkey . . . . .	0.718	0.813	0.768	0.810	0.779	0.671
Chicken . . . . .	.495	.735	.563	.607	.548	.543
Frankfurters (all meat) . . . . .	.846	.923	.836	.846	.850	.806
Ground beef (20% fat) . . . . .	1.001	1.023	1.003	1.009	.989	.973
Cheese, processed . . . . .	.980	1.060	1.020	1.009	.968	.955
Flour, all purpose . . . . .	.141	.165	.145	.161	.138	.144
Margarine . . . . .	.432	.480	.369	.468	.424	.406
Rice . . . . .	.273	.430	.279	.444	.337	.312
Corn, canned . . . . .	.201	.206	.188	.191	.186	.180
Tomatoes, canned . . . . .	.237	.216	.230	.211	.214	.206
Peas, canned . . . . .	.215	.206	.188	.188	.181	.181
Peaches, canned . . . . .	.226	.269	.252	.248	.252	.241
Pears, canned . . . . .	.252	.294	.269	.273	.269	.256
Pineapple, canned . . . . .	.197	.269	.246	.243	.254	.244
Potatoes, frozen french fries . . . . .	.221	.257	.252	.225	.244	.221

<sup>1</sup> USDA prices include cost allowances for Federal administrative expenses, and those of the States and participating schools, along with State and school transportation,

handling, storage, and other related costs. <sup>2</sup> Size categories are in terms of average daily enrollment.



Table 2—Average prices paid by school systems for foods by source of purchase, July 1973-April 1974

Food	Processor	Wholesaler	County/ State purchasing agency	Retailer
	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>
Turkey .....	0.846	0.762	--	0.639
Chicken .....	.563	.614	0.480	.568
Frankfurters (all meat) .....	.850	.889	.437	.902
Ground beef (20% fat) .....	.998	1.009	.861	1.006
Cheese, processed ..	.990	1.007	.954	1.078
Flour, all purpose .....	.165	.145	--	.195
Margarine .....	--	.410	--	.676
Rice .....	--	.356	--	.430
Corn, canned .....	.179	.192	.159	.207
Tomatoes, canned ..	.229	.214	.237	.217
Peas, canned .....	.172	.190	.202	.216
Peaches, canned ...	--	.252	.363	.266
Pears, canned .....	.236	.274	.238	.287
Pineapple, canned ..	.248	.251	.276	.246
Potatoes, frozen french fries .....	--	.239	.207	.199

--None purchased.

most competitive for chicken, frankfurters, and ground beef. Compared with the most expensive source, their

price was 13.4 cents a pound lower for chicken, 14.8 cents lower for ground beef, and 46.5 cents lower for frankfurters.

### Prices Paid for Individual Foods

Table 3 reports the variability in prices paid by the school systems (as reported in table 1) in terms of standard deviations.<sup>3</sup> Prices for meats, cheese, margarine, and rice varied much more than prices for flour, potatoes, fruits, and vegetables. In contrast, there was only a slight difference in price variability among the school system size categories.

Price variability was apparently due to location and other factors. Prices vary substantially over the Nation at all levels of distribution—retail, wholesale, and processor. The standard deviations reported in table 3 appear consistent with national price differences reported by the U.S. Department of Labor's Bureau of Labor Statistics (BLS). As a recent illustration, for July 1974, the BLS retail price report for various cities (Baltimore, Boston, Atlanta, Dallas, Chicago, Twin Cities, Los Angeles, Seattle, and Buffalo) showed the following national price ranges in cents per pound: hamburger, 21.7; turkey, 18.3; chicken, 19.2.

<sup>3</sup>The standard deviation indicates the variation in prices used to compute the averages. For example, for cheese, the average price paid by the school systems with fewer than 2,500 students was \$1.060 per pound. The standard deviation of 14.14 cents means that about two-thirds of all the survey observations were within plus or minus 14.14 cents of the average. The larger the standard deviation associated with a given mean, the greater the variance among the reported prices used to compute the average.

Table 3—Variability in prices of foods purchased by school systems, 1973/74

Foods	School systems by number of students					All systems combined
	25,000 or more	10,000 to 24,999	5,000 to 9,999	2,500 to 4,999	Fewer than 2,500	
	Standard deviation in cents per pound					
Turkey . . . . .	13.24	12.23	15.14	11.00	13.04	12.93
Chicken . . . . .	13.23	10.70	6.22	11.46	18.52	14.72
Frankfurters (all meat) . . . . .	14.68	11.19	13.19	13.25	13.98	13.84
Ground beef (20% fat) . . . . .	15.96	12.83	14.07	18.33	13.19	14.81
Cheese, processed . . . . .	10.71	11.10	13.04	12.18	14.14	12.89
Flour, all purpose . . . . .	3.67	2.21	.95	4.53	2.63	2.78
Margarine . . . . .	6.90	7.26	2.00	11.52	23.11	11.38
Rice . . . . .	13.40	7.58	17.68	2.26	--	10.92
Corn, canned . . . . .	2.10	2.24	2.69	2.00	2.11	2.40
Tomatoes, canned . . . . .	3.54	2.13	3.21	2.96	3.15	3.01
Peas, canned . . . . .	2.62	2.47	2.69	2.25	2.89	2.75
Peaches, canned . . . . .	4.36	2.76	2.30	2.98	4.03	3.50
Pears, canned . . . . .	4.45	2.39	2.51	4.88	4.44	4.02
Pineapple, canned . . . . .	3.99	3.76	3.54	4.27	4.68	4.14
Potatoes, frozen french fries . . . . .	3.46	5.31	4.14	3.91	4.05	4.38

--None.

## COSTS TO USDA

Since the purchases by schools in the open market include costs of delivery to the schools and the administrative costs of the marketing agencies delivering the foods, both procurement and delivery costs and comparable administrative expenses were added to USDA food costs. Prices for the 15 foods were applied to the quantities of these foods purchased by USDA from July 1973 through mid-April 1974, a total of 411.5 million pounds (table 4). The prices were adjusted to cover the pro rata share of Federal administration and intrastate costs. The 15 foods in the study accounted for about 40.3 percent of the 1.02 billion pounds of all USDA foods donated to schools in fiscal year (FY) 1974.

### Federal Administrative Costs

The total Federal administrative cost associated with supplying USDA foods to schools for FY 1974 was estimated by the Office of Management and Finance, USDA. The Federal administrative cost is associated with procuring, handling, processing, and delivering USDA commodities to the State distribution agencies.

Federal administrative expenses for FY 1974 were estimated at \$6.0 million. Of this, \$2.4 million (\$6.0 million  $\times$  40.3 percent) was pro rated among the 15 foods in the survey. The apportionment of the \$2.4 million Federal administrative expenses among the various USDA agencies was:

	Dollars	Percent
Food and Nutrition Service	\$1,319,825	54.1
Agricultural Marketing Service	823,732	33.8
Agricultural Stabilization and Conservation Service	292,269	12.0
Office of the Secretary	2,339	.1
Total	\$2,438,165	100.0

### Intrastate Costs

The total intrastate cost of distributing USDA foods to schools and the apportionment of this cost between State and local schools for FY 1974 was estimated under contract by A. T. Kearney, Inc., of San Francisco, Calif. This includes costs of storing, handling, and delivering

Table 4—Cost of 15 commodities donated by USDA to the National School Lunch Program, and cost if purchased by school systems, July 1973-April 1974

Food	Pounds of food	Cost of USDA purchases	Cost if purchased at average price paid by:		
			All schools <sup>1</sup>	Largest school systems	Smallest school systems
	1,000 pounds	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Turkey .....	33,390	23,966	25,320	22,403	27,140
Chicken .....	51,480	25,464	30,650	27,952	37,836
Frankfurters (all meat) .....	19,608	16,585	16,950	15,801	18,092
Ground beef (20% fat) .....	45,430	45,487	45,275	44,200	46,469
Cheese, processed <sup>2</sup> .....	3,024	2,965	3,011	2,885	3,202
Flour, all purpose .....	178,522	25,155	26,785	25,707	29,454
Margarine .....	15,977	6,908	6,844	6,487	7,665
Rice .....	35,645	9,743	12,727	11,119	15,325
Corn, canned <sup>2</sup> .....	1,546	310	289	277	315
Tomatoes, canned .....	2,957	700	630	609	634
Peas, canned <sup>2</sup> .....	605	130	112	109	124
Peaches, canned .....	1,584	358	395	382	423
Pears, canned .....	14,373	3,617	3,889	3,679	4,222
Pineapple .....	4,145	815	1,038	1,011	1,114
Potatoes, frozen french fries .....	3,240	717	768	714	830
Total .....	411,526	162,920	174,683	163,335	192,845
Cost per pound (cents) .....		39.6	42.4	39.7	46.9
Index (USDA price = 100) .....		100	107.2	100.3	118.4

<sup>1</sup> Cost using average price of all school systems and the weights of relative size of each size category. <sup>2</sup> These items were purchased during FY 1974 but were not distributed to schools.

USDA foods to schools after the commodities reach the primary State food distribution location.

The total intrastate cost of distributing USDA foods to schools in FY 1974 was estimated at \$21,294,000. Of this amount, \$8.6 million (\$21.3 million  $\times$  40.3 percent), was pro rated among the 15 foods used in the study. The apportionment of the pro rated intrastate

food distribution cost for the 15 commodities between schools and the State was:

	<i>Dollars</i>	<i>Percent</i>
Local schools	\$5,251,867	61.2
State	3,329,615	38.8
Total	8,581,482	100.0

## COMPARISON OF USDA AND SCHOOL SYSTEM COSTS

USDA reported total costs of \$162.9 million. If the same tonnages had been purchased at the average prices paid by the largest school systems, USDA costs would have totaled \$163.3 million, or \$415,000 more. Thus, the purchase-cost records of USDA and the school systems of the largest size category were nearly equivalent. If the 411.5 million pounds of food had been purchased at the average prices paid by the smallest school systems, the total costs would have been maximum, \$192.8 million or \$29.9 million more than the USDA costs.

Costs for the largest school system were 0.3 percent higher than costs for USDA-supplied commodities. Those of the smallest school systems were 18.4 percent higher. The average of all school systems was 7.2 percent higher.

### Statistical Significance of Differences

Table 5 shows that the USDA price was lower than the average price paid by the school systems for 10 of the 15 foods. Of these 10, the difference in price paid was statistically significant at either the 5-percent or the 1-percent level for 6 of the commodities. The prices of cheese and turkey were significantly different at the 10-percent level.

Of the five foods which were purchased for less by the school systems than by USDA, the differences were statistically significant for corn, tomatoes, and peas, each at the 1-percent level.

One additional statistical analysis was used to test the difference between the means of: (1) the prices paid by USDA and all school systems and (2) food prices for the largest (25,000 or more students) and smallest (fewer than 2,500 students) systems. The results of the first test indicated that the USDA average food price (39.6 cents/lb.) was significantly lower than the average food price for all schools (42.4 cents/lb.). The second test found that the mean food price (39.7 cents/lb.) for the largest school systems was significantly lower than the average food price (46.9 cents/lb.) for school systems with fewer than 2,500 students.

### Food Costs Per Lunch

The size of the differences in prices paid for food by the school systems and USDA and their statistical

Table 5—Average price paid for 15 foods by USDA and all school systems and weighted standard deviations  
July 1973-April 1974

Food	USDA	All schools (weight- ed prices)	USDA minus all schools	Weight- ed stand- ard de- viations
	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>	<i>Dollars per pound</i>
Turkey . . . . .	0.718	0.758	-0.040	0.024
Chicken . . . . .	.495	.595	-.100	.018*
Frankfurters (all meat) . . . . .	.846	.861	-.015	.012
Ground beef (20% fat) . . . . .	1.001	.997	+.004	.015
Cheese, processed . . . . .	.980	.996	-.016	.011
Flour, all purpose . . . . .	.141	.150	-.009	.006
Margarine . . . . .	.432	.428	+.004	.023
Rice . . . . .	.273	.357	.084	.030**
Corn, canned . . . . .	.201	.187	+.014	.002*
Tomatoes, canned . . . . .	.237	.213	+.024	.004*
Peas, canned . . . . .	.215	.185	+.030	.003*
Peaches, canned . . . . .	.226	.249	-.023	.003*
Pears, canned . . . . .	.252	.271	-.019	.004*
Pineapple, canned . . . . .	.197	.250	-.053	.003*
Potatoes, frozen french fries . . . . .	.221	.237	-.016	.004*

\*Statistically significant at the 1-percent level. \*\*Statistically significant at the 5-percent level.

significance provides some quantitative support for making program policy decisions. Estimates for the total 1973/74 school lunch program may be made in terms of food costs per lunch. These estimates must be interpreted within a "judgmental frame of reference," and with the recognition that the results for the 15 foods are assumed typical of results that would be found if all commodities were studied.

As discussed earlier, total USDA food costs consist of (1) actual food procurement and delivery costs to State



distribution agencies, (2) Federal administrative expenses associated with the costs in (1), and (3) intrastate warehousing, administrative, and transportation costs of distributing USDA foods to local schools. The component costs of the total USDA food cost per lunch for FY 1974 were:

Component costs	Food cost per lunch
	<i>Cents</i>
Food procurement	7.65
Federal administrative expenses	.15
Intrastate costs:	
Warehousing	.12
Transportation	.30
Administrative	.11
Total cost of USDA food	8.33

USDA food procurement cost was based on aggregate data obtained from the Program Reporting Staff, FNS. It was estimated that \$305.8 million was spent on food procurement and approximately 4 billion lunches were served in FY 1974. Federal administrative expenses per lunch were based on estimated total Federal administrative expenses divided by the number of

lunches served in FY 1974. The A. T. Kearney, Inc., report provided the estimated intrastate costs per lunch.

Table 4 presents the index numbers needed to estimate the corresponding cost per lunch of school purchases of the same foods, by size of school system. Application of each index number to the USDA food cost per lunch (8.33 cents), yields the following:

	Food cost per lunch	Index
	<i>Cents</i>	
USDA purchased foods	8.33	100.0
School purchased foods:		
All 150 sample schools	8.93	107.2
Largest schools	8.35	100.3
Smallest schools	9.86	118.4

These results showed: (1) the smallest school systems paid substantially more than the largest ones for a uniform bundle of foods, and (2) the maximum economies of scale in food procurement nearly were achieved for school systems of 25,000 or more students, as the costs of the largest school systems essentially equaled those of the USDA food purchased.<sup>4</sup>

## INTERPRETATION OF FINDINGS

This survey has a number of limitations, some arising from the time constraints mentioned earlier, others from implicit institutional characteristics. Exact cost comparisons become possible only when food specifications used by USDA in making its purchases coincided with those used by school systems purchasing the same foods in the open market. This rarely occurred and, even when food specifications were identical, shipping specifications frequently differed in terms of type of containers and quantities delivered.

Thus, the preceding cost comparisons were between a specified aggregate of foods purchased between July 1973 and mid-April 1974 by USDA according to its published specifications, and the cost of the same foods, matched as closely as possible, purchased by 150 school systems.<sup>5</sup> However, no attempt was made to match container and other shipment specifications. For example, no effort was made to match instructions

associated with USDA purchases such as: "A delivery unit shall be 35,000 pounds net weight" or "Four ten pound cartons shall be snugly packed into new fiberboard box complying with Federal Specifications PPP-B-636; or PPP-B-1163 as follows. . ." Otherwise, all data were "normalized" as discussed in the appendix.

Another fact to consider is that while the nutritional content available in a case of Standard, Extra-standard, or Fancy food will be equivalent (assuming identical drained weight), the nutritional content received by students may vary if students eat different-size servings of each grade of product. Thus, if students should eat a greater proportion of identical servings of Extra-standard than of Standard grade products, the net nutritional contribution made by Extra-standard would be greater, and the cost per delivered nutrient could be either the same or lower. No studies have focused on this question.<sup>6</sup> However, the point here is that our conversions made to normalize grade and can size and price differences associated with container size could not

grades. For example, several schools reported that the "Standard" of some companies appeared to be what other firms were calling "Extra-standard," and vice versa. Such variations will also be reflected in the open market prices reported.

<sup>6</sup>Walker, M. A., and others, "Fruit and Vegetable Acceptance by Students," *Journal of the American Dietetic Association*, Vol. 62 (3) 268, March 1973, reported on factors that influence the acceptance of fresh and processed fruits and vegetables by children. They found children were influenced by "...color, texture-taste and odor, 'among other factors'." Color and texture are important characteristics in differentiating between grades of fruits and vegetables.

<sup>4</sup>Buyers of large quantities may receive benefits in addition to purchasing at the lowest available prices. They may be able to make such specifications as quality of packaging, drained weights for processed fruits and vegetables, and can size. This study did not attempt to ascertain whether USDA received more of such benefits than did the large school systems.

<sup>5</sup>The "as closely as possible concept" still leaves a substantial margin for differences. For example, USDA specifications call for net *drained* weights for canned foods and for can or container size. In the open market, few school systems specify drained weights. To the extent that USDA drained weights vary from market practices, the respective prices probably will reflect this difference. Also, schools report that they often find variations in trade definitions of Standard and Extra-standard

and did not attempt to adjust for differences in product palatability, if any, which might have existed among either grades or brands.

Further, characteristics inherent in the purchase procedures necessarily followed by USDA preclude strict statistical extrapolation of the kind usually projected for future time periods. USDA has historically purchased commodities to help remove commodity surpluses from the open market and to improve the diets of food program participants, including school children. Each year the bundle of commodities purchased, at bid, has varied in its composition, reflecting overall market conditions and the state of the economy, as well as the demand characteristics of purchased commodities. The resulting cost to USDA fluctuates widely and the purchase pattern of one year does not necessarily indicate the next. Nor is a comparison of USDA's purchase experience in one year with the purchase experience of school systems in the open market during the same year necessarily a precise indicator of the relationships to be expected in some other time period.

The findings relating to USDA commodity distribution to school systems must be further interpreted within our present institutional context. For example, the smaller school systems may be purchasing

delivery and other services along with the food received from full line wholesalers, whereas the larger systems may be performing some of these services themselves. However, during periods of rapid inflation the costs for handling smaller orders may rise disproportionately compared with costs of handling larger ones. This is most likely to occur in regions with geographically separated markets and relatively few processors and wholesalers. Thus, during periods of rapid inflation prices per unit may increase more for smaller school systems than for larger school systems buying in the same markets.

In addition, if there are shortages of specific foods, the market may give preferential allocation of such items to the largest sellers, who are usually in urban areas. Larger school systems buying from the largest sellers would then be more likely to obtain foods in short supply than would the smaller systems.

Despite these possibilities, there appears justification to conclude that substantial economies of scale exist in the procurement between the smallest and largest school systems. Given the size of food purchases involved (about \$1.8 billion annually), a potential exists for saving the Nation's schools several hundred million dollars by more effective procurement practices.

## APPENDIX

### Procedures

Time constraints required that the survey be conducted by telephone. Two telephone contacts were required for each respondent. During the initial contact, cooperation was solicited and, when received, enough information was provided to enable the respondent to develop his own report schedule. During the second interview, the respondent read the cost information from this schedule. The "Telephone Patter" describing the facts requested during the first conversation and the blank schedule completed by the ERS staff person during the second conversation are shown as exhibit 1, pages 10-13.

Because of the extensive information requested and the complex procedure for obtaining this information from the respondent, a pre-test was conducted among nine school systems. Of the nine, eight provided information, while the staff of one reviewed the first draft of the "Telephone Patter" and fact sheet.

Of the foods considered for study several were not likely to have been purchased by schools in the open market between July 1973 and mid-April 1974. These included peanut butter, cornmeal, dry beans, and salad oil. As a result of the information obtained in the pre-test, canned corn and ground beef were substituted for dry beans and peanut butter. The others were dropped.

### Product-Price Comparability

USDA prices were those paid for actual purchases made between July 1973 and April 1974 (except for pineapple, which was last purchased in June 1973). To these commodity prices were added allowances for transportation, warehousing, and State school administration costs. These costs per hundredweight were estimated by A. T. Kearney, Inc., under an FNS contract. USDA (Federal) administrative costs were supplied by the Department's Office of Management and Finance.

The ERS survey was conducted between April 22 and 26, 1974. The survey asked for the most recent purchase of each commodity made by each school system during the 1973/74 school year, and related information needed to interpret the reported costs based on such characteristics as grade, size, kind of container, and number of units purchased.

Prices used to compute comparative costs were simple averages of those reported by the 150 school systems surveyed. In each instance, where required, the average prices were adjusted for differences in container size, grade, and date of purchase (seasonality) to make them as comparable as possible to the prices paid by USDA for the same 15 commodities.

### Grade and Can Size Adjustments

All canned commodities were converted to the Extra-standard equivalent for vegetables and to Choice for fruits. Can sizes other than number 10 were converted to a number 10 equivalent.

When a can size was number 10 but the grade was either Fancy or Standard, margin factors derived from monthly list prices published by *Food Production/Management* were used (to subtract or add) to convert to an Extra-standard or Choice basis. When the commodity grade was the same, but the can size differed, industry conversion factors for changing a can size (such as number 303, 2, or 2½) to a number 10 equivalent were applied. When both can size and grade differed the conversion was more complex. Fortunately, there were very few instances where the dual adjustment was required (exhibit 2, p. 14).

In the case of ground beef, all prices were converted to a 20 percent fat (80 percent lean) basis. The monthly wholesale price series reported by the Agricultural Marketing Service for boned beef of 90 percent, 80 percent, and 50 percent lean (10 percent, 20 percent, and 50 percent fat) were used to derive a monthly adjustment factor for each percentage point of difference in fat content. Most adjustments involved 2 to 5 percent fat content differences (exhibit 3, p. 15). Because there was no means for converting (normalizing) ground beef pre-mixed with an extender, no ground beef with a pre-mixed extender was included.

### Form of Product

Where the commodity was purchased in multiple forms, such as halves, slices, pieces, and crushed, each form was initially treated as a separate product for making conversions to the same grade and can size. At that point, prices for the various forms of the same product were averaged to obtain an adjusted price to use in market basket cost computations.

### Other Commodity Conversions

Conversions of the price of long grain to medium grain rice (exhibit 4, p. 15) and prices of turkey of less than 14 pounds to an equivalence for birds of more than 14 pounds, were based on monthly BLS wholesale quotations.

For rice, each month's BLS quotation for medium grain No. 2 rice was divided into the same month's No. 2 long grain grade quotation to determine medium grain price as a percentage of long grain price. This percentage factor was used to apply to long grain prices reported by the school systems for the same month to convert to a medium grain basis.



### Adjustments by Time of Purchase

Since prices of the 15 commodities varied over the year and USDA and school purchases were not necessarily made at the same time, prices were put into a common temporal base by adjusting prices paid by the schools. Market price quotations for all of the commodities were obtained from Market News or commercial sources for all of the months. The differential between the USDA purchase price and the market quotation was calculated for each month in which USDA purchases were made. The average of these differentials was computed and applied to all other months in which no USDA purchases were made to estimate a USDA purchase price for those months.

A weighted average USDA purchase price for the months in which actual purchases were made was calculated.<sup>1</sup> The differential between the weighted

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<sup>1</sup> Prices were weighted by the pounds of commodities purchased by USDA, July 1973-April 1974.

average USDA purchase price and the purchase prices, either actual or estimated, in each month was calculated.

The school purchase price, corrected for grade and can size differentials, was then adjusted by the differential between the weighted average purchase price and the actual or calculated purchase price at which the school would have bought if their purchases had been distributed over time in the same way as the USDA purchases.

### Number of Observations by Product and School Size

The schools' open market purchases were influenced by the quantities of foods they carried over from the previous school year and by USDA foods which they had not used. For example, flour was not purchased as often or in as large quantities as frankfurters. Exhibit 5 (p. 16) presents the number of observations by product and by school size which composed the sample results. These results were used to compute the average prices paid by schools in the open market.



Telephone Survey of Cost of Selected Foods  
Purchased by Schools, In Current School Year  
Economic Research Service  
U.S. Department of Agriculture  
Washington, D.C. 20250

EXHIBIT 1

Telephone Patter

Presupplied Information: Name of School District \_\_\_\_\_  
Community \_\_\_\_\_ District Superintendent \_\_\_\_\_  
Phone: Area \_\_\_\_\_ : \_\_\_\_\_.

Hello! This is \_\_\_\_\_ of the Economic Research Service, U.S. Dept. of Agriculture. We are conducting a study of the costs of some foods frequently purchased by schools for use in their lunch programs, for the Food and Nutrition Service. Do your schools participate in Federal school lunch programs? ☐ Yes ☐ No (If no, close out, as only participating schools are desired.)

Your name was supplied as the person who either can provide the needed information or who can refer me to the right person. My questions relate to 15 foods used in school lunch programs, and I will be asking for information about the number of units of the *most recent purchase of this school year*, their total cost, and related facts.

Are you the person who can supply this kind of information? ☐ Yes ☐ No

If NO; To whom should I talk?

Designated respondent: \_\_\_\_\_  
(including title)

Phone: Area \_\_\_\_\_ : \_\_\_\_\_ . Thank you.

(Repeat relevant parts of lead in given above for proper person.)

Are you responsible for purchasing food items for an entire school district; several schools, a single school, or what?

- ☐ Entire school district, ALL SCHOOLS
- ☐ Several schools, the "Satellite System"
- ☐ Single school (on site kitchen)
- ☐ Non-school commercial contract
- ☐ Other: Specify \_\_\_\_\_

Instruction:

If respondent is responsible for several Satellites, or for Satellites and one or more on site (single school) purchases, use *pre-selected subsample* provided for such contingency, to identify the one for which you wish him to report.

First, let's treat some questions for which approximate answers will suffice. What is the approximate number of students enrolled in the schools for which you are reporting? \_\_\_\_\_ . [no. of students] . What is the average daily number of lunches served in the schools for which you are reporting? \_\_\_\_\_ [no. lunches served] .

When you purchase foods do you have to pay a sales or excise tax? ☐ Yes ☐ No. If yes; will the cost figures reported include or exclude this tax? ☐ Yes; ☐ No; If yes; what % per dollar is the tax? \_\_\_\_\_ %.

When you made your most recent purchases was any credit beyond the normal 30 days advanced? ☐ Yes ☐ No; If yes, what was the annual rate of interest paid? \_\_\_\_\_ %. When making food purchases this year, did you receive a "school discount?" ☐ Yes ☐ No. If yes, what \_\_\_\_\_ %? (If discount rate does not apply to all purchases identify those of the 15 foods which were discounted)

NOW, let's take up the questions for which you may wish to use records. We shall call back for your responses on: day: \_\_\_\_\_ Time: \_\_\_\_\_

The foods in which we are interested are:

- |                       |                        |                              |
|-----------------------|------------------------|------------------------------|
| 1. Turkey             | 6. Flour [All purpose] | 11. Canned pears             |
| 2. Chicken            | 7. Canned corn         | 12. Canned Pineapple         |
| 3. Frankfurters       | 8. Canned peas         | 13. Margarine                |
| 4. Ground Beef        | 9. Canned tomatoes     | 14. Frozen French Fried Pot. |
| 5. Cheese [processed] | 10. Canned peaches     | 15. Rice                     |

For each food we are interested in the MOST RECENT [last] purchase made in the current school year. For each food we need to know the following information:

1. Date of purchase; month and year will suffice.
2. The total number of units purchased.
3. The unit in which the purchase was made; and delivered: e.g. cases of # 10; 303; 2; 2½; 2 sized cans; bags of 25, 50 or 100 lbs; boxes with so many packages of franks, or number of turkey per box, etc.
4. If you have a computer printout of price per unit paid, that will be fine.
5. If no price per unit is available without calculation, the total [cost] value of the last purchase is fine.
6. For each food what were the critical product specifications? For canned goods were they: fancy; choice extra std.; std.; whole, halves; pieces; cut up; diced; heavy or light syrup? For franks: were they 8 or 10 to the lb.? Were they all meat? Skinless? If not, what % was meat? For turkey, what was the grade? Were they Toms or hens? Were they 14 lbs. or heavier? For ground beef, what was the % fat? If not, available, a word description will do, e.g. was it ground chuck, or meat scraps? What acceptance or testing procedure is usually adopted to determine if ground beef meets your standards?
7. What was the brand or trade name?
8. Upon what basis did you negotiate price? Was it upon a specified quantity, e.g. 20,000 lbs. or a truck or car lot? Was it upon an annual quantity, price frozen, or with price adjustment mid-year etc. Did reported costs INCLUDE transportation from supplier to the initial school or school warehouse location? If not, what was the total cost for such transportation, rounded to nearest dollar?
9. What was each food's source of purchase? Processor; wholesaler or broker? State purchasing agency? or Retailer?
10. Are there any additional explanations of cost which you wish us to know so that we can understand the reported cost figures? (e.g. allowance for "leakers" or spoiled meat)

Thank you for your cooperation. I will call back on: \_\_\_\_\_ at: \_\_\_\_\_ so you can provide the information. If you can not be available, for whom should I ask? \_\_\_\_\_  
Area: \_\_\_\_\_ :

FOOD  [Most recent (last) purchase of the present school year]	Date		Total number of units pur- chased	Unit in which pur- chase was deliver- ed: Cases of # 10, 2, 2½, 303 size cans; bags of 25 or 100 lbs.; boxes with number of packages of franks or number of turkeys per box.	Price per unit if available without comput.	Total value of last purchase of each food [dollars]	Commodity specifica- tions: Fancy; ext. std.; std.; whole kernel; cream sty. heavy or light syrup; frozen or fresh; all meat; or % that is meat for ground beef, % fat; or word description; If turkey, 14 lbs. or over; Tom or hen; halves?	Brand or trade name	Description of basis of negotia- tion, e.g. what sized lot used?  Transportation cost if NOT includ- ed in reported cost.	Source of last purchase made, for each food
	Mo.	Yr.								
1. Turkey										
2. Chicken										
3. Frankfurters										
4. Ground Beef										
5. Cheese (Processed)										
6. Flour (All purpose)										
7. Canned Corn										
8. Canned peas										
9. Canned tomatoes										
10. Canned peaches										
11. Canned pears										
12. Canned pineapple										
13. Margarine										
14. Frozen French Fried potatoes										
15. Rice										

Code for *Column 9*: [1] Processor; [2] Wholesaler or broker; [3] State purchasing agency; [4] Retailer. With schedule *completed* ask: Do the schools for which you reported also use supplies donated by the USDA ☐ Yes ☐ No; If YES, What was the cost per cwt. or pound for USDA donated supplies which you had to pay either to the State or a private agency \_\_\_\_\_? This charge should include storage, transportation, and related services.

Date called: \_\_\_\_\_

EDITED SHEET FOR ADP

Instruction: Either circle or insert appropriate code: SCHOOL Number: \_\_\_\_\_

SIZE 1 2 3 4 5 REGION 1 2 3 4 5 SCHOOL LUNCH TYPE 1 2 3 4 5

Average No. Lunches \_\_\_\_\_ Sales Tax 0 Yes 1 No; Credit 0 Yes 1 No

Discount 0 Yes 1 No

FOOD	Code	DATE		Number of Units Purchased	Price per Unit	Source of Purchase
		MO.	Yr.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Iced (Fresh) Turkey	2					
Frozen Turkey	3					
Chicken (Whole, cut up)	4					
Chicken (Parts)	5					
Franks, All Meat 8-lb.	6					
Franks, All Meat 10-lb.	7					
Franks with Extenders	8					
Franks Unspecified	9					
Ground (Converted to 20% fat)	10					
Cheese (Processed)	11					
Flour (All Purpose)	12					
Corn (Whole Kernel)	13					
Corn (Cream style)	14					
Peas, Sweets	15					
Tomatoes (Whole)	16					
Tomatoes (Broken, crushed, pieces)	17					
Peaches, Cling, Sliced	18					
Peaches, Cling, ½'s)	19					
Peaches, Freestone Slice	20					
Peaches, Freestone ½'s	21					
Pears ½'s	22					
Pears, Pieces+ Irreg.	23					
Pineapple, Sliced	24					
Pineapple, Diced, Tidbits	25					
Pineapple Chunks	26					
Pineapple, Crushed	27					
Margarine	28					
Frozen French Fr. Pot.	29					
Rice # 2 Medium Gr.	30					

Where possible convert Fancy and Standard to Extra Standard. If no grade is given, include as Extra Standard, unless price deviation is so large this does not make sense.

## EXHIBIT 2

### Conversion Instructions

Example 1—When conversion is between one can size to another, grade remaining constant, apply appropriate conversion factor by dividing price to be converted by the conversion factor.

#### Conversion Factors—Can Size Only

24/303's converted to 6/10's .....	.616
24/ 2's converted to 6/10's .....	.748
24 2.5's converted to 6/10's .....	1.088

Thus, if Sept. 73 price for a case of # 303 Standard Grade peas is to be converted to a case of 6/# 10 cans, divide Standard price by .616. Here, \$3.40/ .616 equals \$5.52.

Or, if # 303 case of Extra Standard peaches, price \$9.25 is converted to a case of 6/10's,  $9.25 / 1.088$  equals \$8.502. Note that 24 number 2.5 cans weigh more than a case of 6/10's. The reverse holds for other can sizes.

Example II—When conversion is associated with three differences, conversion becomes more complex. The three differences are: (a) quantity of food; (b) can differential, large size usually sells for less than smaller size; and (c) grade or quality. We will illustrate three examples and provide a short cut approach which was used to provide the differentials including or incorporating all differences to be used on a commodity by commodity and month by month basis.

#### A. Alaska Type Peas — Price quotations for Sept. '73

a. Assumed reported price for this illustration, for one case of # 303 Standard peas .....	\$3.20
b. List price of # 303 Standard peas .....	\$3.40
c. List price of a case of # 10 Standard Grade .....	\$5.41
d. List price of a case of Extra Standard Grade # 10 .....	\$5.785
Reported price for # 303 Std. converted to # 10 cans Std. or \$3.20/ .616 .....	\$5.195
List price # 303 Std. converted to # 10 cans .....	$(\$3.40 / .616)$ \$5.520
List price # 10 Extra Std. ....	\$5.785
List price # 10 Standard .....	\$5.41

List price # 10 can is subtracted from converted # 10 price to  
obtain the can price differential -----\$ 5.52-\$5.41 = 11 cents.

Quality differential is obtained by subtracting list price # 10 can  
from list price Extra Std. # 10 can ----- \$5.785-\$5.41 -----37.5 cents

Amount of differential associated with simply more product in case of 6/ # 10's than case of # 303's,  
equals the list price of \$5.41 minus the can differential 11 cents or \$5.30 minus the list price for  
# 303, or \$3.40 or -----\$1.90



Now, the Reported List Price for one case # 303's Std. was \$3.20.

Converted to a Std. Grade # 10 size case it would equal -----\$5.195

Since we want it in number 10 cans, we need not deduct amount representing value of the difference in quantity (\$1.90), but we must take account of the 11 cents pricing differential associated with can size. We also need to take account of the grade or quality difference of 37.5 cents.

Thus: \$5.195 Converted Rept. Price of # 303 to # 10 basis, plus 37.5 cents quality (grade differential) equals \$5.57, but from this we need to deduct the 11 cents can size price difference or the converted reported price is \$5.46.

There is a short cut, and this will be what we use. The logic though is based on the first procedure.

Thus, we start with the converted reported price, that is the \$3.20 was converted to \$5.195, (equals # 10 case of Std. grade)

The list price \$3.40 for # 303 size can also converted to # 10 size basis ----- \$5.519.

The difference (\$5.519-\$5.195) -----(-32.4 cents).

By algebraically adding the difference to the list price for # 10 \$5.785 we derive the equivalent price of \$5.46 derived the more cumbersome way above.

### EXHIBIT 3

Conversion for Ground Beef but *ONLY* for conversions for fat contents greater than 20% to 20%. For those with fat content below 20%, see \_\_\_\_\_. He has conversion factor for these.

The *conversion* factor is stated in terms of the conversion for each 1 percentage point of fat content.

#### Monthly Conversion Factors for Each 1% of Fat Difference

	July	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.&Apr.
Factor	.01772	.01885	.01839	.01804	.01793	.01831	.01737	.01472

Price adjusted = Price reported / 1-(Number of percentage points difference) (monthly conversion (factor for each one percentage point difference in fat content)).

#### Illustration

Reported price for April is .76. Fat content was 22%;

Conversion to 20% basis:  $P_{Adj.} = \frac{.76}{1-(2) (.01472)} = .76/.97 = .784$  per lb.

### EXHIBIT 4

Long Grain to Medium Grain Rice; Multiple Long Grain Price by:

	July	Aug.	Sept.	Oct.	Nov.	Dec. through April
Factor:	.880	.820	.841	.767	.900	.896

Turkeys: Multiply the price for lightweight birds, 14 pounds and under by factor to convert to large bird equivalent, 14 pounds and above.

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.+Apr.
Factor:	.98	.98	.96	.89	.91	1.04	.99	.94	.92

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EXHIBIT 5

Number of observations by product and school size

School size by number of students	Cheese	Flour	Magarine	Rice	Corn	Tomatoes	Peas	Peaches
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
25,000 or more .....	23	7	6	4	23	18	20	28
10,000-24,999 .....	25	8	10	4	26	25	22	26
5,000-9,999 .....	27	3	4	2	26	17	23	30
2,500-4,999 .....	24	2	4	2	23	17	24	29
Fewer than 2,500 .....	35	7	5	1	34	20	32	36
U.S. total .....	134	27	29	13	132	97	121	149
	Pears	Pineapple	Potatoes	Turkey	Chicken	Franks	Ground beef	Total
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
25,000 or more .....	22	36	18	10	15	25	18	273
10,000-24,999 .....	23	31	22	14	8	26	16	286
5,000-9,999 .....	22	26	22	7	8	25	23	265
2,500-4,999 .....	18	20	16	6	9	26	23	243
Fewer than 2,500 .....	29	33	25	5	11	34	30	337
U.S. total .....	114	146	103	42	51	136	110	1,404